



May 6, 2019

Reference No. 038443

Ms. Leslie Patterson
Remedial Project Manager
United States Environmental Protection Agency 947930
Region V
77 West Jackson Boulevard
Mail Code SR-6J
Chicago, Illinois
60604

Ms. Tamara McPeck
Environmental Response and Revitalization
Ohio Environmental Protection Agency
Southwest District Office
401 East Fifth Street
Dayton, Ohio
45402

Dear Ms. Patterson and Ms. McPeck:

**Re: Phase 2A Vertical Aquifer Sampling Results and Phase 1B Groundwater Sampling Results
South Dayton Dump and Landfill Site, Moraine, Ohio (Site)**

This letter provides the results for the Phase 2A Vertical Aquifer Sampling (VAS) and Phase 1B groundwater sampling conducted using temporary monitoring wells at the South Dayton Dump and Landfill Site (Site) and vicinity during the period of January 2019 through February 2019. GHD has prepared this letter on behalf of the Respondents to the Administrative Settlement Agreement and Order on Consent (ASAO) for Remedial Investigation/Feasibility Study (RI/FS) of the Site, Docket No. V-W-16-C-011 (Respondents).

Phase 2A Vertical Aquifer Sampling

One VAS location (VAS-39) was completed from January 22, 2019 through February 20, 2019 as described in the Remedial Investigation/Feasibility Study (RI/FS) Work Plan for Operable Units 1 and 2 (RI/FS Work Plan). The location of VAS-39 is shown on Figure 1c (included in Attachment 1). The log for VAS-39 is included in Attachment 2. VAS-39 was completed to 100 feet (ft) below ground surface (BGS) as required by the RI/FS Work Plan. Information regarding VAS field activities and sample collection is provided by the following:

- VAS was conducted by Cascade Environmental using the rotosonic drilling method, with field oversight by GHD. The amount of water added during drilling was recorded (in the field logbook).



Pumping was conducted to remove at least two times the volume added at each sample interval, prior to purging for sample collection.

- Low flow purging was completed using a bladder pump with Teflon tubing, and with the pump intake set at the middle of each sampling interval. Field parameters were recorded to determine stabilization before sampling. The field parameters included dissolved oxygen (DO), oxidation reduction potential (ORP), pH, temperature, specific conductance, and turbidity.
- Groundwater samples were collected from the required sample intervals at each location, with the exception of one sample interval where purging could not be conducted due to insufficient water. Purging and stabilization data are summarized in Attachment 3.
- GHD submitted a total of 12 investigative groundwater samples plus various quality assurance/quality control (QA/QC) samples (including six trip blanks, one field duplicate, and one matrix spike/ matrix spike duplicate sample) to TestAmerica Laboratories in North Canton, Ohio for analysis of parameters required by the RI/FS Work Plan. This includes the following: Volatile Organic Compounds (VOCs); Semi-volatile Organic Compounds (SVOCs); Pesticides and polychlorinated biphenyls (PCBs); Metals (total and dissolved) and cyanide; and general chemistry (chloride, nitrate, nitrite, sulfate).
- All investigative samples were analyzed for VOCs, metals (total and dissolved) and general chemistry parameters, with the exception of one sample interval due to insufficient water production. Select samples were analyzed for the other parameters listed above in accordance with the RI/FS Work Plan.
- Sampling and analysis activities were conducted consistent with the project-specific Field Sampling Plan (FSP) and Quality Assurance Project Plan (QAPP).
- Purge water was containerized for management and off-Site disposal as investigation-derived waste (IDW).

Phase 1B Temporary Monitoring Wells

A total of two borehole/temporary monitoring wells (TMWs) were completed at two locations (BH18-19 and BH19-19) on January 14, 2019 as described in the RI/FS Work Plan. Each temporary monitoring well was completed to the depth required by the RI/FS Work Plan.

The locations of BH18-19 and BH19-19 are shown on Figure 1c (included Attachment 1). The logs for borehole/TMW locations BH18-19 and BH19-19 are included in Attachment 4. Each location was completed to the depth required by the RI/FS Work Plan as noted below:

- Drilling was conducted by Envirocore Inc. using direct push methods, with field oversight by GHD. The soil core retrieved from each location was logged to determine stratigraphy to the completed depth, ranging from 14 to 19 ft BGS. Each soil boring was sealed using bentonite chips (hydrated).



- At each location a second off set boring was advanced to install a temporary monitoring well, constructed with a 4-foot steel screen set at the desired depth based on stratigraphic information.
- Low flow purging was completed using a bladder pump with Teflon tubing, and with the pump intake set at the middle of each 4-foot screen. Field parameters were recorded to determine stabilization before sampling. The field parameters included DO, ORP, pH, temperature, specific conductance, and turbidity. Purging and stabilization data are summarized in Attachment 5.
- Groundwater samples were collected from each temporary monitoring well. GHD submitted a total of two investigative groundwater samples plus various QA/QC samples (including one trip blank and one field duplicate) to TestAmerica Laboratories in North Canton, Ohio for analysis of parameters required by the RI/FS Work Plan, which includes the following: VOCs; SVOCs; Pesticides and PCBs; Herbicides; Metals (total and dissolved), mercury and cyanide; and general chemistry (chloride, nitrate, nitrite, sulfate).
- Sampling and analysis activities were conducted consistent with the project-specific FSP and QAPP.
- Purge water was containerized for management and off-Site disposal as IDW.

The validated analytical results are summarized in the tables provided in Attachment 6 and includes two tables for each VAS and temporary monitoring well location, i.e., full set of results, and summary of detected results. The type and range of detected chemical concentrations are similar to or less than other existing data, all of which will be incorporated into the project database for inclusion in the RI reporting deliverables. Further data interpretation and comparison to criteria values will be conducted as part of the overall data assessment. TestAmerica laboratory analytical reports and GHD data validation reports are available on request.

The remaining VAS and BH/TMW locations that were proposed in the RI/FS Work Plan include: VAS-41 located on DP&L property; non responsive Both of these locations are proposed to be eliminated as discussed in GHD's letter dated January 22, 2019.



Should you have any questions on the above, please do not hesitate to contact us.

Sincerely,

GHD

A handwritten signature in blue ink, reading "Julian Hayward". The signature is written in a cursive, flowing style.

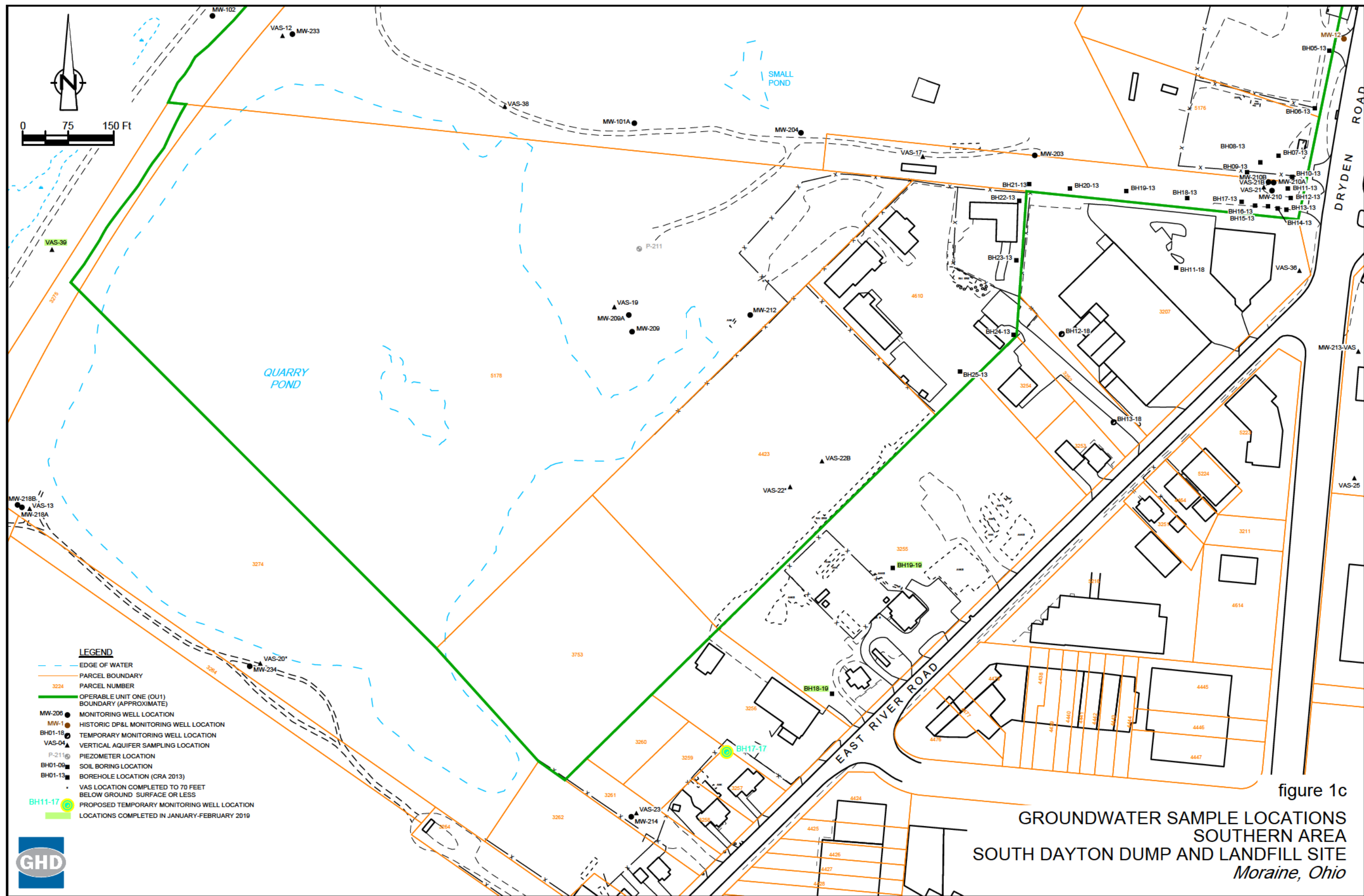
Julian Hayward

BR/kf/9

Encl.

cc: (all by pdf) Ken Brown, ITW
 Bryan Heath, NCR
 Wendell Barner, Barner Consulting
 Jim Campbell, EMI
 Andrew Dorn, ITW
 Brett Fishwild, Jacobs
 Valerie Chan, GHD

Attachment 1



Attachment 2



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 1 of 3

PROJECT NAME: SOUTH DAYTON DUMP AND LANDFILL SITE
PROJECT NUMBER: 038443
CLIENT: PRP GROUP
LOCATION: MORaine, OHIO

HOLE DESIGNATION: VAS-39
DATE COMPLETED: February 20, 2019
DRILLING METHOD: ROTASONIC
FIELD PERSONNEL: J. CLOSE

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH BGS	BOREHOLE	SAMPLE				
				NUMBER	INTERVAL	REC (%)	N' VALUE	PID (ppm) / RAD
2	ML-SILT, trace clay, trace fine gravel and coarse sand, cohesive, dark brown, moist			1RS		60		0.3 / 0
4				4559 NEG SUDAN IV				
6	GW-GRAVEL, some medium to coarse sand, loose, fine to coarse grained, well graded, brown, wet - 3-4' cobble at 5.1ft BGS	5.00 5.20		2RS 5-10 -214		98		0.2 / 0
8	SW-SAND, some fine gravel, loose, medium to coarse grained, well graded, gray, wet							
10	GW-GRAVEL, some medium to coarse sand, loose, fine to coarse grained, well graded, orangish brown, wet	9.00						
12	- cobble at 12.5ft BGS			3RS 10-15 -215		100		0 / 0
14	- cobble at 14.5ft BGS							
16	- cobble at 16.0ft BGS							
18	- cobble at 17.9ft BGS			4RS 15-20 -216		100		0 / 0
20	- cobble at 19.5ft BGS							
22	SW-SAND, loose, fine to medium grained, well graded, gray, wet	21.80		5RS 20-25 -217		100		0 / 0
24	- increase in silt content, little coarse sand at 23.5ft BGS							
26								
28				6RS 25-30 -218		100		0 / 0
30								
32								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ∇
CHEMICAL ANALYSIS

OVERBURDEN LOG 038443-50-WI-GPJ GHD Corp 4/1/19



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 2 of 3

PROJECT NAME: SOUTH DAYTON DUMP AND LANDFILL SITE
PROJECT NUMBER: 038443
CLIENT: PRP GROUP
LOCATION: MORaine, OHIO

HOLE DESIGNATION: VAS-39
DATE COMPLETED: February 20, 2019
DRILLING METHOD: ROTASONIC
FIELD PERSONNEL: J. CLOSE

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH BGS	BOREHOLE	SAMPLE				
				NUMBER	INTERVAL	REC (%)	N VALUE	PID (ppm) / RAD
36	SW/GW-SAND/GRAVEL, loose, fine to coarse sand, fine gravel, well graded, gray, wet	36 00	BACKFILLED WITH BENTONITE GROUT	7RS 30-40 -219/220		100		0 / 0
38				38-39.3 NEG SUDAN IV				
40	CL-CLAY, dense, cohesive, gray, moist	39 30						
42	SW/GW-SAND/GRAVEL, trace silt, loose, medium to coarse sand, fine gravel, well graded, gray, wet	40 00						
44								0.3 / 0
46				8RS 40-50 -221		100		
48	- little to some coarse gravel at 48.0ft BGS							
50								
52		52 50						
54	CL-CLAY (TILL), trace fine to coarse gravel, dense, hard, cohesive, gray, moist							
56				9RS		100		0 / 0
58								
60								
62	SW-SAND, loose, medium to coarse grained, well graded, gray, wet	62 00						
64	GW-GRAVEL, some coarse sand, loose, well graded, gray, wet	64 00		10RS 60-70 -222		100		0 / 0
66								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ☒
CHEMICAL ANALYSIS ☐

OVERBURDEN LOG 038443-50-WI.GPJ GHD Corp 4/1/19



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 3 of 3

PROJECT NAME: SOUTH DAYTON DUMP AND LANDFILL SITE
PROJECT NUMBER: 038443
CLIENT: PRP GROUP
LOCATION: MORaine, OHIO

HOLE DESIGNATION: VAS-39
DATE COMPLETED: February 20, 2019
DRILLING METHOD: ROTOSONIC
FIELD PERSONNEL: J. CLOSE

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH BGS	BOREHOLE	SAMPLE				
				NUMBER	INTERVAL	REC (%)	N VALUE	PID (ppm) / RAD
70								
72	SW-SAND, loose, medium to coarse grained, well graded, gray, wet	71.00						
74	GW-GRAVEL, some coarse sand, loose, fine to coarse grained, well graded, gray, wet	73.00						
76				11RS 70-80 -223 76-77.7 NEG SUDIAN IV		100		0 / 0
78	CL-CLAY, trace fine gravel and coarse sand, dense, hard, cohesive, gray, moist	77.70						
80	GW-GRAVEL, some coarse sand, loose, fine to coarse grained, well graded - 4" cobble at 79.5ft BGS	78.50						
82								
84								
86				12RS 80-90 -224		100		
88								
90	SW/GW-SAND/GRAVEL, loose, medium to coarse sand, fine gravel, well graded, gray, wet	90.00						0.3 / 0
92	- coarse gravel at 93.0ft BGS							
94	- 3" silty sand zone at 94.0ft BGS							
96	GW-GRAVEL, little medium to coarse sand, loose, fine grained, well graded, gray, wet	96.00		13RS 90-100 -225		100		0 / 0
98								
100	END OF BOREHOLE @ 100.0ft BGS	100.00						

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ☒
CHEMICAL ANALYSIS ☐

OVERBURDEN LOG 038443-50-WI.GPJ GHD Corp 4/1/19

Attachment 3

Table 1

**Stabilization Parameters - VAS39
South Dayton Dump and Landfill Site
Moraine, Ohio**

Location	Date	Time	Sample ID	Sample Interval (ft bgs)	Temperature (°C)	Conductivity (mS/cm)	Turbidity (NTU)	DO (mg/L)	pH (units)	ORP (mV)
VAS37	1/22/2019	14:10	JC-214	5-10	7.64	0.747	265	25.00	6.81	-111.9
		14:15			7.66	0.732	294	12.87	6.88	-208.9
		14:20			7.64	0.726	234	3.71	7.05	-376.0
		14:25			7.61	0.721	185	2.37	7.07	-419.5
		14:30			7.70	0.718	166	6.30	7.08	-449.4
		14:35			7.55	0.713	138	4.20	7.09	-464.6
		14:40			7.68	0.710	130	2.91	7.09	-479.0
		14:45			7.72	0.708	137	2.40	7.09	-468.9
		14:50			7.66	0.707	130	2.15	7.09	-481.9
		9:50	JC-215	15-20	10.06	0.724	37.9	0.93	7.12	-447.9
		9:55			10.03	0.724	14.8	0.31	7.10	-402.1
		10:00			9.97	0.719	14.1	0.32	7.11	-467.2
		10:05			9.98	0.716	12.9	0.41	7.11	-471.0
		10:10			10.02	0.715	12.1	0.50	7.10	-465.6
		10:15			10.05	0.714	11.9	0.54	7.10	-457.4
		11:35	JC-216	15-20	11.13	0.685	46.0	0.41	7.26	-104.1
		11:40			10.82	0.679	39.4	0.31	7.24	-153.1
		11:45			10.66	0.679	31.0	0.27	7.24	-169.9
		11:50			10.49	0.679	24.7	0.27	7.25	-220.4
		11:55			10.30	0.680	24.1	0.28	7.25	-195.1
		13:05	JC-217	20-25	12.39	0.675	207	0.64	7.31	-358.9
		13:10			12.29	0.680	223	0.22	7.41	-507.8
		13:15			12.03	0.681	>1000	0.23	7.37	-455.1
		13:20			11.87	0.679	>1000	0.22	7.40	-442.1
		13:25			11.76	0.678	>1000	0.22	7.41	-438.7
		13:30			11.77	0.678	>1000	0.16	7.43	-455.3
		13:35			11.70	0.678	>1000	0.14	7.44	-475.1
		14:35	JC-218	25-30	11.75	0.662	70.5	0.35	7.40	-455.4
		14:40			11.08	0.663	67.7	0.21	7.42	-490.4
		14:45			10.57	0.651	44.5	0.18	7.33	-455.1
		14:50			10.57	0.653	41.3	0.18	7.35	-439.2
		14:55			10.61	0.655	31.9	0.19	7.38	-380.9
	1/29/2019	14:05	JC-219 /JC-220	30-40	4.99	0.589	>1000	2.20	7.00	-505.00
		14:10			3.29	0.588	>1000	0.96	7.38	-594.20
		14:15			5.65	0.594	>1000	0.60	7.37	-597.40
		14:20			5.62	0.592	>1000	0.55	7.36	-598.00
		14:25			5.59	0.590	>1000	0.52	7.36	-598.70
	2/4/2019	13:55	JC-221	40-50	11.79	0.491	32.1	0.57	6.97	-444.9
		14:00			11.62	0.481	56.2	0.39	7.03	-487.3
		14:05			11.54	0.472	60.6	0.20	7.06	-418.7
		14:10			11.49	0.471	83.6	0.17	7.07	-488.9
		14:15			11.47	0.470	119	0.23	7.09	-524.3
	2/5/2019			50-60	Not Sampled - Insufficient water production					
		9:45	JC-222	60-70	9.68	0.549	62.6	0.51	7.28	-410.9
		9:50			9.44	0.554	16.2	0.37	7.29	-338.9
		9:55			9.51	0.553	7.98	0.36	7.26	-434.9
		10:00			9.55	0.553	6.87	0.32	7.27	-465.0
		10:05			9.45	0.551	14.8	0.37	7.26	-461.1
		11:45	JC-223	70-80	8.94	0.596	58.3	2.09	7.44	-368.4
		11:50			8.51	0.596	53.5	0.77	7.40	-388.7
		11:55			8.43	0.585	84.2	0.57	7.31	-316.9
		12:00			8.44	0.576	277	0.47	7.32	-450.2
		12:05			8.45	0.568	538	0.37	7.34	-346.3
		12:10			8.45	0.567	>1000	0.32	7.34	-377.4

Table 1

Stabilization Parameters - VAS39
South Dayton Dump and Landfill Site
Moraine, Ohio

Location	Date	Time	Sample ID	Sample Interval (ft bgs)	Temperature (°C)	Conductivity (mS/cm)	Turbidity (NTU)	DO (mg/L)	pH (units)	ORP (mV)
VAS37 cont'd	2/5/2019	15:25	JC-224	80-90	9.90	0.631	41.4	0.45	7.31	-415.2
		15:30			9.90	0.631	325	0.30	7.33	-389.0
		15:35			9.71	0.629	>1000	0.28	7.31	-431.9
		15:40			9.73	0.628	>1000	0.26	7.32	-428.9
		15:45			9.72	0.628	>1000	0.26	7.31	-365.7
	2/20/2019	10:25	JC-225	90-100	8.47	1.149	23.1	0.66	6.59	-316.9
		10:30			8.44	1.145	84.3	0.45	6.88	-392.8
		10:35			8.49	1.141	131	0.39	6.95	-380.9
		10:40			8.54	1.138	167	0.34	6.98	-387.1
		10:45			8.47	1.136	202	0.35	7.01	-390.1
		10:50			8.58	1.136	215	0.38	7.03	-409.0
		10:55			8.60	1.136	244	0.33	7.04	-401.9

Notes:

°C Degrees Celsius
DO Dissolved Oxygen
ft bgs feet below ground surface
mS/cm milli-Siemens/cm
mV millivolts
NTU Nephelometric Turbidity Unit
ORP Oxidation Reduction Potential

Attachment 4



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 1 of 1

PROJECT NAME: SOUTH DAYTON DUMP AND LANDFILL SITE
PROJECT NUMBER: 038443
CLIENT: PRP GROUP
LOCATION: MORaine, OHIO

HOLE DESIGNATION: BH18-19
DATE COMPLETED: January 14, 2019
DRILLING METHOD: GEOPROBE
FIELD PERSONNEL: J. CLOSE

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH BGS	TEMP MONITORING WELL	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm) / RAD
	TOPSOIL	0.17						
	ML-SILT, trace clay, cohesive, dark brown, moist	1.08						
2	SW/GW-SAND/GRAVEL, loose, fine, medium and coarse sand, fine gravel, well graded, dry			1GP		42		0 / 0
4								
6				2GP		54		0 / 0
8								
10				3GP		58		0 / 0
12								
14	- wet at 14.5ft BGS			4GP 14-19 NEG SUDAN IV		50		0 / 0
16								
18				5GP (14.5-18.5)		54		0 / 0
20	END OF BOREHOLE @ 20.0ft BGS	20.00						
22								
24								
26								
28								
30								
32								
34								

WELL DETAILS
Screened interval:
14.50 to 18.50ft BGS
Length: 4ft
Material: STAINLESS STEEL

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ☒
CHEMICAL ANALYSIS ☐

OVERBURDEN LOG 038443-50-WI-GPJ GHD Corp 4/22/19

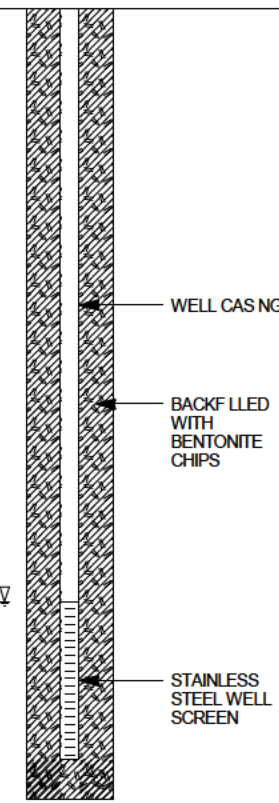


STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 1 of 1

PROJECT NAME: SOUTH DAYTON DUMP AND LANDFILL SITE
PROJECT NUMBER: 038443
CLIENT: PRP GROUP
LOCATION: MORaine, OHIO

HOLE DESIGNATION: BH19-19
DATE COMPLETED: January 14, 2019
DRILLING METHOD: GEOPROBE
FIELD PERSONNEL: J. CLOSE

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH BGS	TEMP MONITORING WELL	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm) / RAD
2	ML-SILT, trace clay, cohesive, dark brown, moist	0.75		1GP		71		0 / 0
4	SW/GW-SAND/GRAVEL, loose, fine to coarse sand, fine gravel, well graded, tan/brown, dry			2GP		60		0 / 0
6				3GP		56		0 / 0
8	SW-SAND, little fine gravel, fine, medium and coarse grained, tan/brown, dry	10.00		4GP		52		0 / 0
10				5GP		60		0 / 0
12								
14	GW-GRAVEL, some medium to coarse sand, trace silt, loose, fine grained, well graded - wet at 15.0ft BGS	13.70						
16								
18								
20	END OF BOREHOLE @ 20.0ft BGS	20.00						
22								
24								
26								
28								
30								
32								
34								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ☒
CHEMICAL ANALYSIS ☐

OVERBURDEN LOG 038443-50-WI-GPJ GHD Corp 4/22/19

Attachment 5

Table 1

**Stabilization Parameters - BH18-19
South Dayton Dump and Landfill Site
Moraine, Ohio**

Location	Date	Time	Sample ID	Sample Interval (ft bgs)	Temperature (°C)	Conductivity (mS/cm)	Turbidity (NTU)	DO (mg/L)	pH	ORP (mV)
BH18-19	1/14/2019	11:15	JC-001/ 002	14.5-18.5	13.08	0.898	773	12.40	7.05	162.4
		11:20			12.78	0.901	441	11.10	7.06	152.2
		11:25			12.59	0.908	211	9.45	7.07	144.1
		11:30			12.52	0.919	115	6.68	7.08	134.6
		11:35			12.49	0.923	53.1	8.80	7.08	121.7
		11:40			12.52	0.923	35.6	8.61	7.07	117.2
		11:45			12.46	0.923	21.9	8.31	7.08	112.3
		11:50			12.41	0.923	15.1	6.63	7.08	108.0
		11:55			12.36	0.924	10.8	6.87	7.08	106.6
		12:00			12.33	0.923	10.5	6.43	7.08	106.9

Notes:

°C Degrees Celsius
 DO Dissolved Oxygen
 ft bgs feet below ground surface
 mS/cm milli-Siemens/cm
 mV millivolts
 NTU Nephelometric Turbidity Unit
 ORP Oxidation Reduction Potential

Table 2

**Stabilization Parameters - BH19-19
South Dayton Dump and Landfill Site
Moraine, Ohio**

Location	Date	Time	Sample ID	Sample Interval (ft bgs)	Temperature (°C)	Conductivity (mS/cm)	Turbidity (NTU)	DO (mg/L)	pH	ORP (mV)
BH19-19	1/14/2019	14:25	JC-003	15-19	13.02	0.891	900	5.49	6.92	113.2
		14:30			13.16	0.899	332	5.91	6.90	108.4
		14:35			13.15	0.897	269	6.22	6.90	98.1
		14:40			13.13	0.903	190	6.08	6.89	92.0
		14:45			13.12	0.905	114	5.99	6.89	87.5
		14:50			13.14	0.906	85.2	5.86	6.88	82.9

Notes:

°C Degrees Celsius
 DO Dissolved Oxygen
 ft bgs feet below ground surface
 mS/cm milli-Siemens/cm
 mV millivolts
 NTU Nephelometric Turbidity Unit
 ORP Oxidation Reduction Potential

Attachment 6
(see 038443Patterson-McPeck-9-ATT6 file)